

CLAIMS

I claim:

- 1 1. A tactile user interface device, comprising:
2 a substrate;
3 a plurality of tactile elements disposed on said substrate wherein each of said plurality of
4 tactile elements correspond to a pixel, a fraction of a pixel, or a group of pixels on a video
5 display and wherein each of said plurality of tactile elements comprises:
6 means for sensing pressure from a user's finger to determine if the user has depressed any
7 of said plurality of tactile elements; and
8 means for conveying tactile feedback information to said user.
- 1 2. The tactile user interface device of claim 1 wherein said means for sensing pressure from
2 a user's finger comprises a device that provides an electrical signal when said pressure from
3 user's finger exceeds a set pressure threshold.
- 1 3. The tactile user interface device of claim 2 wherein said device that provides an electrical
2 signal when said pressure from user's finger exceeds a set pressure threshold is a switch.
- 1 4. The tactile user interface device of claim 2 wherein said device that provides an electrical
2 signal when said pressure from user's finger exceeds a set pressure threshold is a piezoelectric
3 sensor.

1 5. The tactile user interface device of claim 1 wherein said tactile feedback information
2 includes elevations, vibrations, textures, and temperatures.

1 6. The tactile user interface device of claim 1 wherein said means for conveying tactile
2 feedback information to said user comprises at least one microelectromechanical device, wherein
3 said at least one microelectromechanical device has at least two mechanical states.

1 7. A tactile user interface device, comprising:
2 a planar substrate;
3 a plurality of pins disposed on said planar substrate wherein each of said plurality of pins
4 correspond to a pixel, a fraction of a pixel, or a group of pixels on a video display and wherein
5 each of said plurality of pins comprises:
6 means for sensing pressure from a user's finger to determine if the user has depressed any
7 of said plurality of pins; and
8 means for conveying tactile feedback information to said user.

1 8. The tactile user interface device of claim 7 wherein said means for sensing pressure from
2 a user's finger comprises a device that provides an electrical signal when said pressure from
3 user's finger exceeds a set pressure threshold.

1 9. The tactile user interface device of claim 8 wherein said device that provides an electrical
2 signal when said pressure from user's finger exceeds a set pressure threshold is a switch.

1 10. The tactile user interface device of claim 8 wherein said device that provides an electrical
2 signal when said pressure from user's finger exceeds a set pressure threshold is a piezoelectric
3 sensor.

1 11. The tactile user interface device of claim 7 wherein said means for conveying tactile
2 feedback information to said user comprises a device for positioning said pins to a plurality of
3 positions.

1 12. The tactile user interface device of claim 11 wherein said device for positioning said pins
2 to a plurality of positions is a piezoelectric device.

1 13. The tactile user interface device of claim 11 wherein said device for positioning said pins
2 to a plurality of positions is an electromagnet.

1 14. A method for fabricating a tactile user interface device, comprising the steps of:
2 fabricating a substrate;
3 disposing a plurality of tactile elements on said substrate wherein each of said tactile
4 elements comprises:
5 means for sensing pressure from a user's finger; and
6 means for conveying tactile feedback information to said user.

1 15. The method of claim 14 wherein the step of disposing a plurality of tactile elements on
2 said substrate further comprises the steps of:

- 3 providing a means for sensing pressure from a user's finger to determine if the user has
- 4 depressed any of said plurality of tactile elements; and
- 5 providing a means for conveying tactile feedback information to said user.